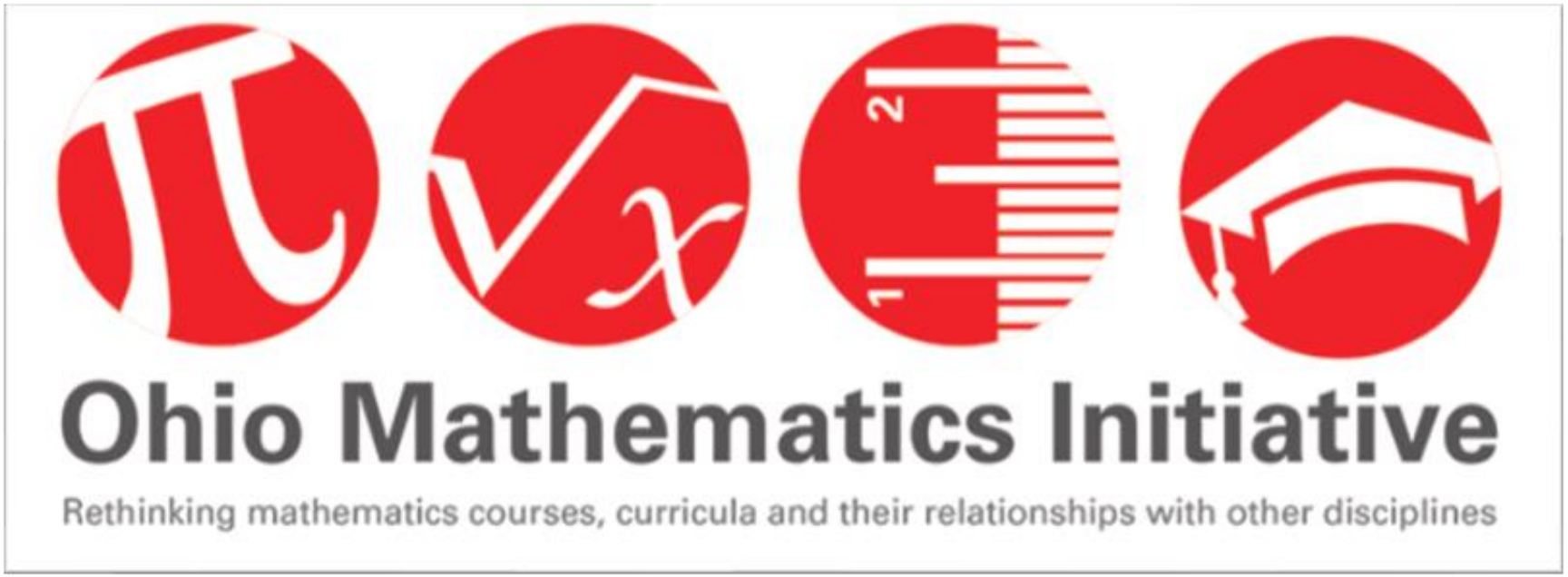
TRANSFER TALK Tuesday

Math Pathways

For best WebEx quality for all, please:

- **Keep yourself muted**
- **Do not turn on your video**

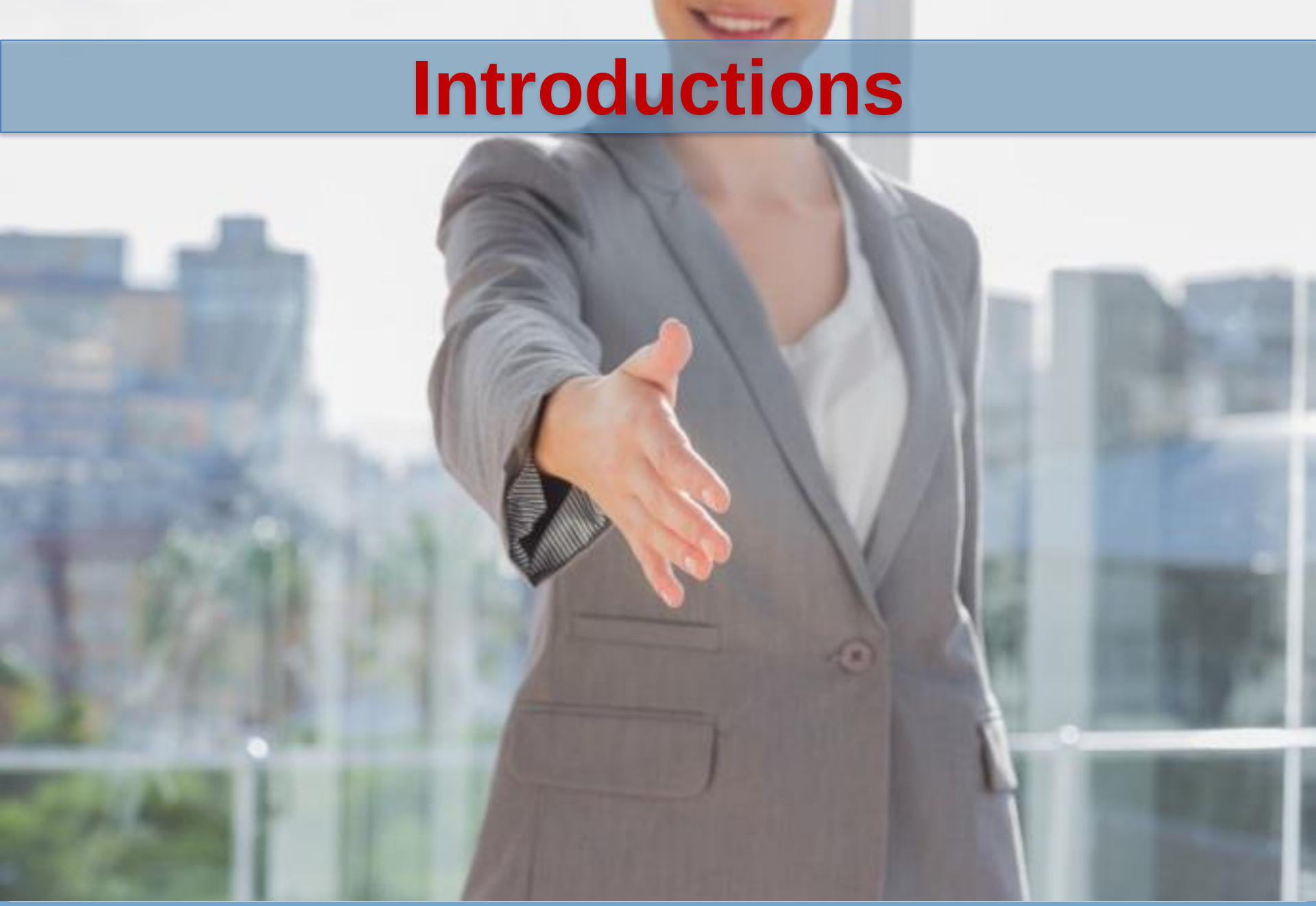
This webinar will be recorded and posted to our website.


Ohio Mathematics Initiative
Rethinking mathematics courses, curricula and their relationships with other disciplines

OMI's Subgroups

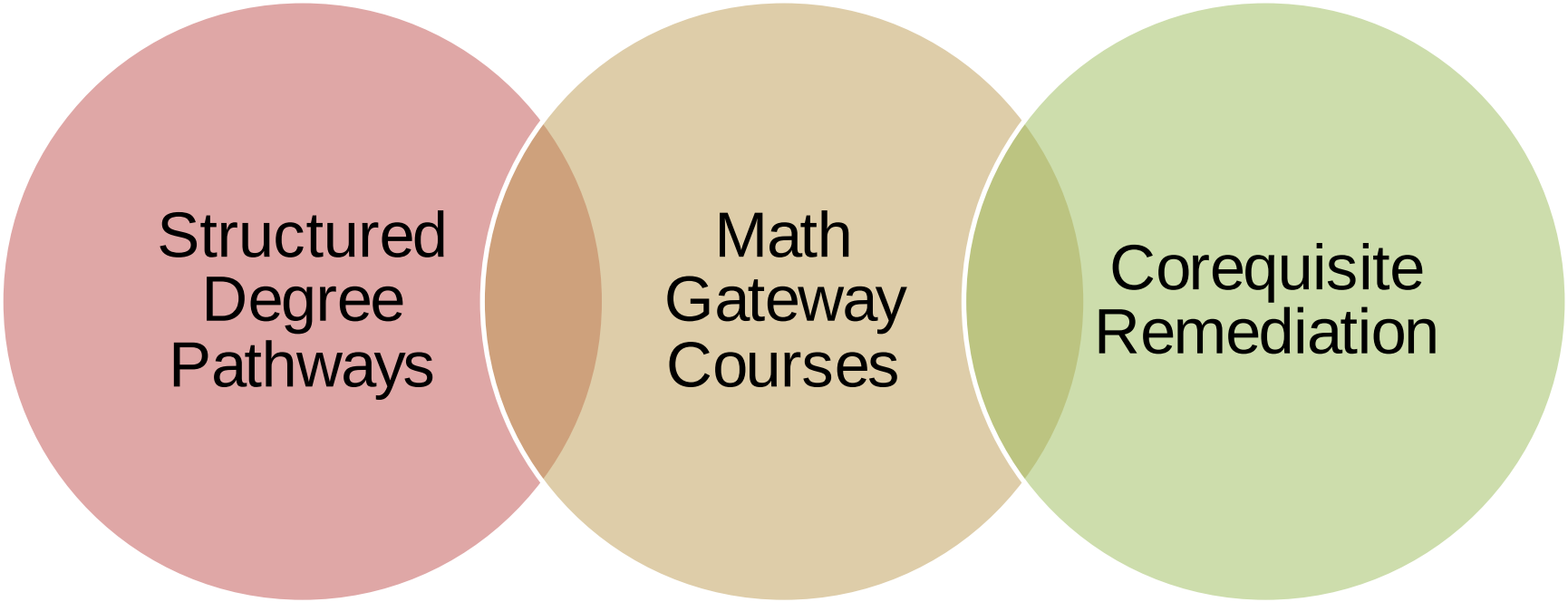
1. New and Alternative Pathways
2. Revision of the Ohio Transfer Module Criteria
3. Communication Outreach and Engagement
4. Data Collection, Analysis and Sharing
5. Secondary and Postsecondary Alignment

Introductions

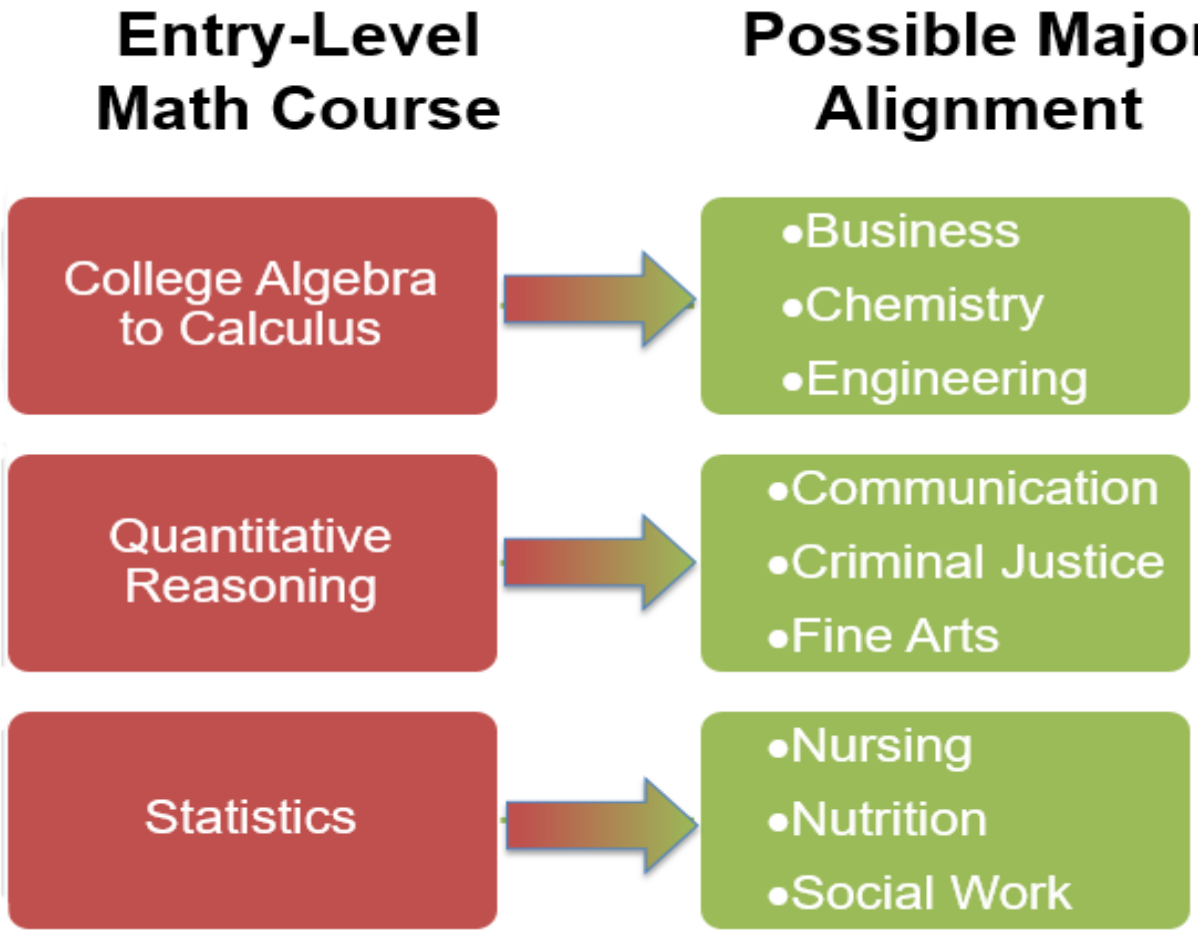


Higher Education Landscape

BRIDGES TO SUCCESS



Higher Education Mathematics Gateway Courses



New Emerging Pathways in Ohio

- **Data Science** (still being drafted)
- **Technical Math** (recently posted)
- **Discrete Math** (in final stages of the endorsement process)
- **Math for Elementary Education** (recently posted)

Ohio TRANSFER TO DEGREE guarantee

Guaranteed Transfer Pathways

Statewide

Social Work/Social Services/ Human Services Associate of Arts

June 20, 2018

GENERAL EDUCATION REQUIREMENTS/OHIO TRANSFER MODULE		Minimum Credit Hours
ENGLISH COMPOSITION AND ORAL COMMUNICATION:		3
Course 1:	Any OTM approved First Writing (TME001) course	3
MATHEMATICS, STATISTICS, AND LOGIC:		3
Course 1:	Any OTM approved mathematics [Highly recommended: Introductory Statistics (TMM010)][1]	3
ARTS AND HUMANITIES:		6
+ Course 1:	Any OTM approved Arts and Humanities course (Arts related)	3
+ Course 2:	Any OTM approved Arts and Humanities course (Humanities related)	3
SOCIAL AND BEHAVIORAL SCIENCES:		6
+ Course 1:	Introduction to Psychology (OSS015)	3
+ Course 2:	Introduction to Sociology (OSS021)	3
NATURAL SCIENCES:		6-7
Course 1:	Any OTM approved Natural Sciences course	3
Course 2:	OTM approved Biological Science course with lab (Recommended: Human Biology)[2]	3-4
ADDITIONAL CREDITS:		12
Course 1:	Any OTM approved Second Writing (TME002) course	3
Courses:	Up to 9 hours of additional OTM approved courses[3]	9
GENERAL EDUCATION/OHIO TRANSFER MODULE TOTAL:		36-38

https://www.ohiohighered.org/OGTP

Ohio TRANSFER TO DEGREE guarantee

Guaranteed Transfer Pathways

Completed	Gateway Course	Completed	Gateway Course
Business		**Arts & Humanities**	
• Business	Calc 1 or B. Calc	• Art History	QR
Social & Behavioral Sciences		• Communication Studies	QR
• Anthropology	Intro Stats	• English	QR
• Economics	Calc 1 or B. Calc	• History	QR
• Geography	Intro Stats	• Music	QR
• Political Science	Intro Stats	• Philosophy	QR
• Psychology (B.A.)	Intro Stats	• Studio/Fine Arts	QR
• Psychology (B.S.)	College Algebra	• Theatre	QR
• Social Work	Intro Stats	**STEM**	
• Sociology	Intro Stats	• Biology	Calc 1
Still Undecided		• Chemistry	Calc 1
• Social & Behavior Sciences for Undecided Students	Intro Stats	• Geology	Calc 1
		• Mathematics	Calc 1
		• Physics	Calc 1

Ohio TRANSFER TO DEGREE guarantee

Guaranteed Transfer Pathways

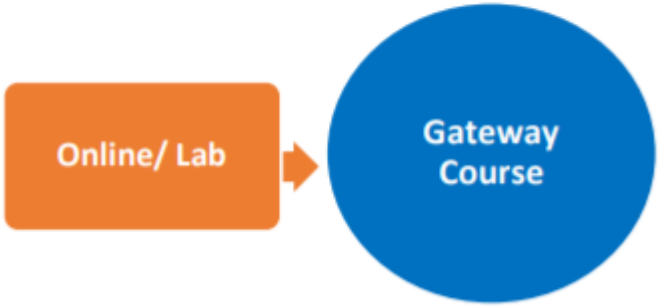
Under Construction		
Business • Applied Business **Social & Behavioral Sciences** • Social/Human Services **Arts & Humanities** • Journalism • Public Relations/Advertising • Telecommunications **Education** • AYA • Middle • Intervention Specialist • ECE	**Public Safety** • Fire Science/EMT • EMS/Paramedic • Criminal Justice **Health Sciences** • Dietetics • Exercise Science/OT/PT • Health Information Management • Medical/Clinical Laboratory • Nursing • Respiratory Therapy	**STEM** • Aerospace, Agricultural & Mechanical Engineering • Civil Engineering • Civil/Construction Engineering Technology • Computer/Electrical Engineering • Computer Science • Information Systems • Information Technology

Co-requisite Models

Figure 1: Paired Course Model

Figure 2: 101 Plus Model

Figure 3: Technology-Mediated Support Model



Student-Ready Colleges

K-12 Landscape

Ohio Department of Education

#EachChildOurFuture

In Ohio, each child is *challenged, prepared* and *empowered.*

Vision

In Ohio, each child is ***challenged*** to discover and learn, ***prepared*** to pursue a fulfilling post-high school path and ***empowered*** to become a resilient, lifelong learner who contributes to society.

Four Learning Domains

Foundational Knowledge & Skills
Literacy, numeracy and technology

Well-Rounded Content
Social studies, sciences, languages, health, arts, physical education, etc.

Leadership & Reasoning
Problem-solving, design thinking, creativity, information analytics

Social-Emotional Learning
Self-awareness & management, social awareness, relationship skills, responsible decision-making

One Goal

Ohio will increase annually the percentage of its high school graduates who, one year after graduation, are:

- Enrolled and succeeding in a post-high school learning experience, including an adult career-technical education program, an apprenticeship and/or a two-year or four-year college program;
- Serving in a military branch;
- Earning a living wage; or
- Engaged in a meaningful, self-sustaining vocation.

Three Core Principles

- Equity
- Partnerships
- Quality Schools

10 Priority Strategies

1. Highly effective teachers & leaders
2. Principal support
3. Teacher & instructional support
4. Standards reflect all learning domains
5. Assessments gauge all learning domains
6. Accountability system honors all learning domains
7. Meet needs of whole child
8. Expand quality early learning
9. Develop literacy skills
10. Transform high school/provide more paths to graduation

Strategy 10

Ensure high school inspires students to **identify paths to future success**, and give students **multiple ways** to demonstrate the knowledge, skills and dispositions necessary for high school graduation and beyond.

Problem Statement

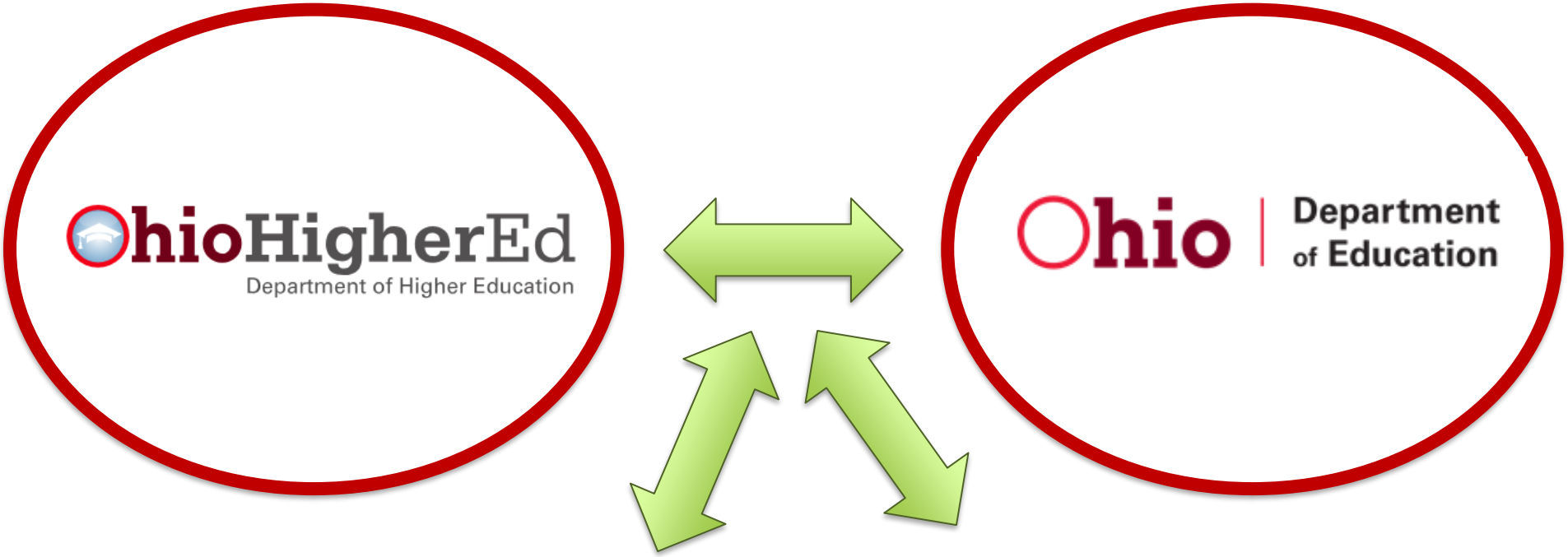
Ohio has a diverse student body, where each child has unique postsecondary aspirations.

K-8 Math → Algebra 1 → Geometry → Algebra 2 → Pre-Calculus → Calculus

Diverse career aspirations, one math pathway!

New Initiative: Strengthening Ohio's High School Math Pathways

Strengthening Ohio's Math Pathways



ESG Education Strategy Group
ACHIEVING GREATER IMPACT

The University of Texas at Austin
Charles A. Dana Center

Equivalence

Mathematics units must include one unit of Algebra 2 or the *equivalent* of Algebra 2.

Equivalence

Equivalent thinking and reasoning but **NOT** equivalent content

Goals of Initiative

Ohio needs to develop pathways for high school mathematics that provide a seamless transition to a student's postsecondary aspirations.

1. To promote **equity**, any courses that are created should be equally **rigorous** to the traditional math pathway.
2. Pathways should be **relevant** to a student's future career goals. Not only will relevant courses help a student achieve their goals, but they will also create more buy-in from the students and help develop a positive math identity.
3. Pathways should also be **flexible** in case a student changes his or her mind about his or her future plans.
4. Pathways should be **coherent** with pathways in higher education to provide students with a seamless transition.

What this initiative is NOT about

- Changing graduation requirements
- Reducing rigor
- Tracking

What is this initiative about?

Relevance

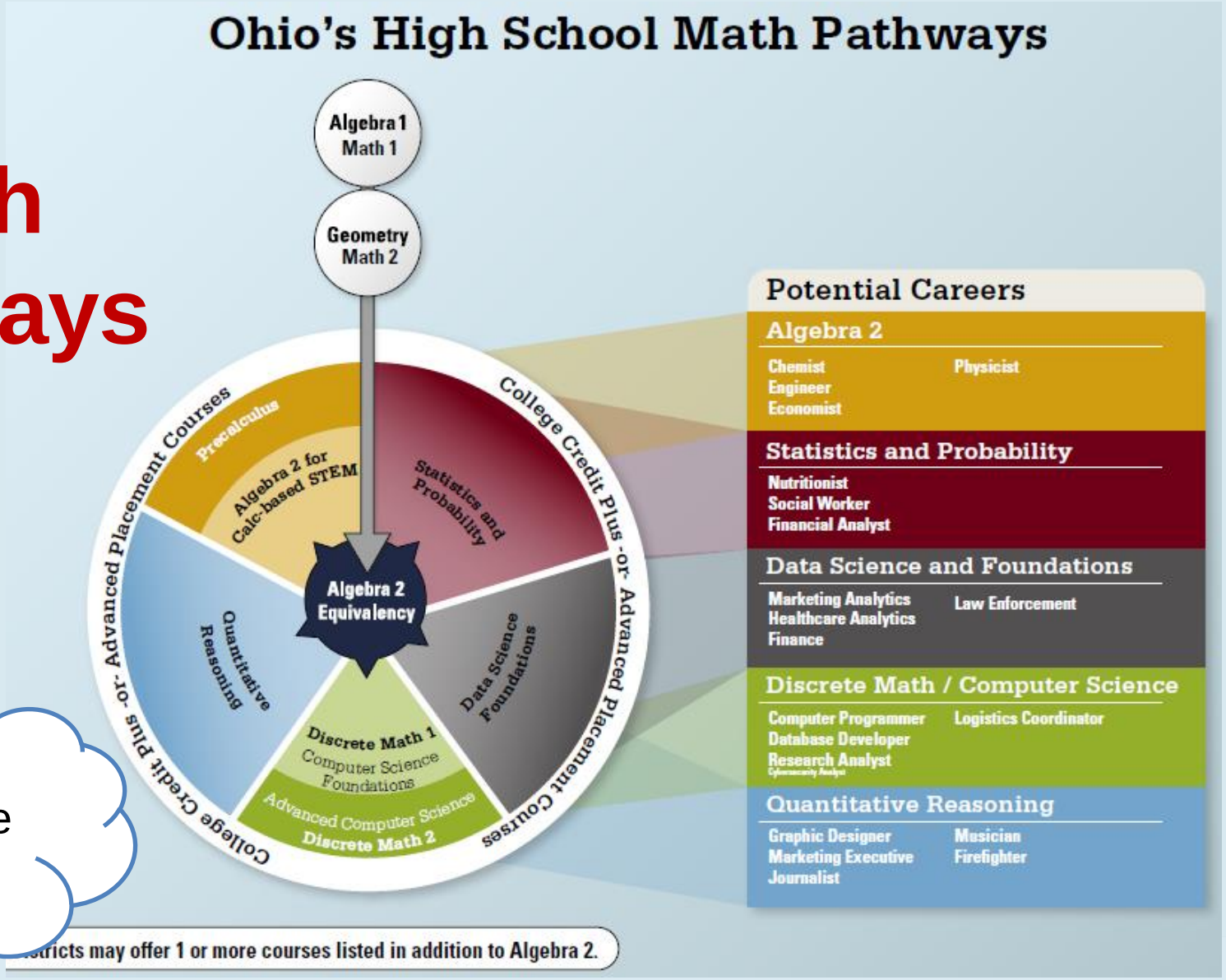
Equity

Rigor

Math Identity

Student Success!!

Math Pathways



ALL Pathways are college preparatory

Descriptions of Courses

COURSE	DESCRIPTION
Statistics and Probability	In-depth study of probability, data analysis, and statistics including applying the concept of random variables to generate and interpret probability distributions, transforming data to aid in interpretation and prediction, and testing hypotheses using appropriate statistics
Quantitative Reasoning	Application of mathematics skills such as algebra to the analysis and interpretation of quantitative information (numbers and units) in a real-world context to make decisions that are relevant to daily life. Critical thinking is its primary objective and outcome.
Data Science	Data Science is a blend of various tools, algorithms, and machine learning principles with the goal to discover hidden patterns from raw data. The difference between data science and statistics is that where statistics focuses on explaining the data, data science focuses on using data to make predictions and decisions.
Discrete Math	The study of mathematical properties of sets and systems that have a countable number of elements including applications of systematic counting techniques and algorithmic thinking to represent, analyze, and solve problems.

Equity

Students **choose** pathways based on their future aspirations. Students are **NOT** placed based on perceived preparation levels.

Tre is undecided about his future. He likes fixing things but has not always had positive experiences with math.

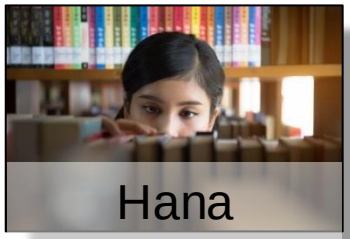
Year Three
He takes a quantitative reasoning class and his interest in math grows when it is applied to the real world. Tre would like to pursue the engineering field.

Year Four
Tre decides to take Algebra 2 and move into the calculus-based STEM path.

The electronics area has always fascinated Mia but she doesn't take an interest in math while at school.

Year Three
Mia takes a quantitative reasoning class and finds out that she really likes math when it is connected to real-world applications.

Year Four
She decides to pursue an associate degree in engineering technology and takes College Credit Plus Technical Math 1 for dual credit.



Hana is undecided about her future but has always held a passion for English language arts.

Year Three
While she is undecided, Hana elects to take a quantitative reasoning class.

Year Four
Hana becomes more interested in social work, so she takes AP Statistics and Probability.

Noah loves art and would like to pursue it as a future career.

Year Three
He takes quantitative reasoning and is amazed how math connects to art. He wants to major in graphic design.

Year Four
Noah takes a College Credit Plus quantitative reasoning class for dual credit.

Proposed Timeline

Fall 2020

- **Course Development**

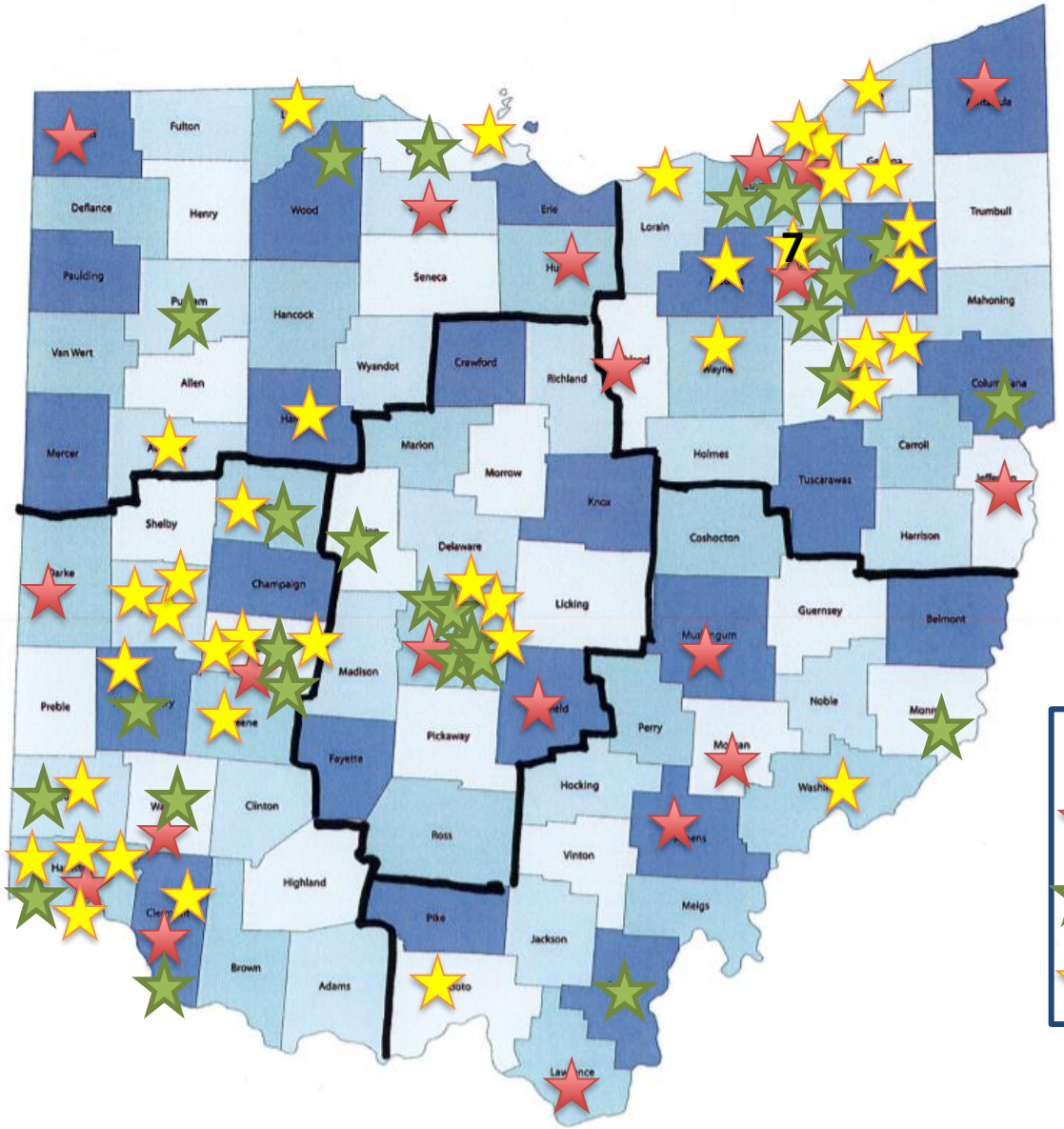
Fall 2021

- **The initiative is launched on the website.**
- Quantitative Reasoning and Data Science Foundations are piloted.

Fall 2022

- **Schools implement pathways and Algebra 2 equivalency courses.**
- Computer Science/Discrete Math piloted.
- Quantitative Reasoning and Data Science Foundations Pilots are expanded in phases across the state.

Quantitative Reasoning Pilot Schools 21-22



Key:

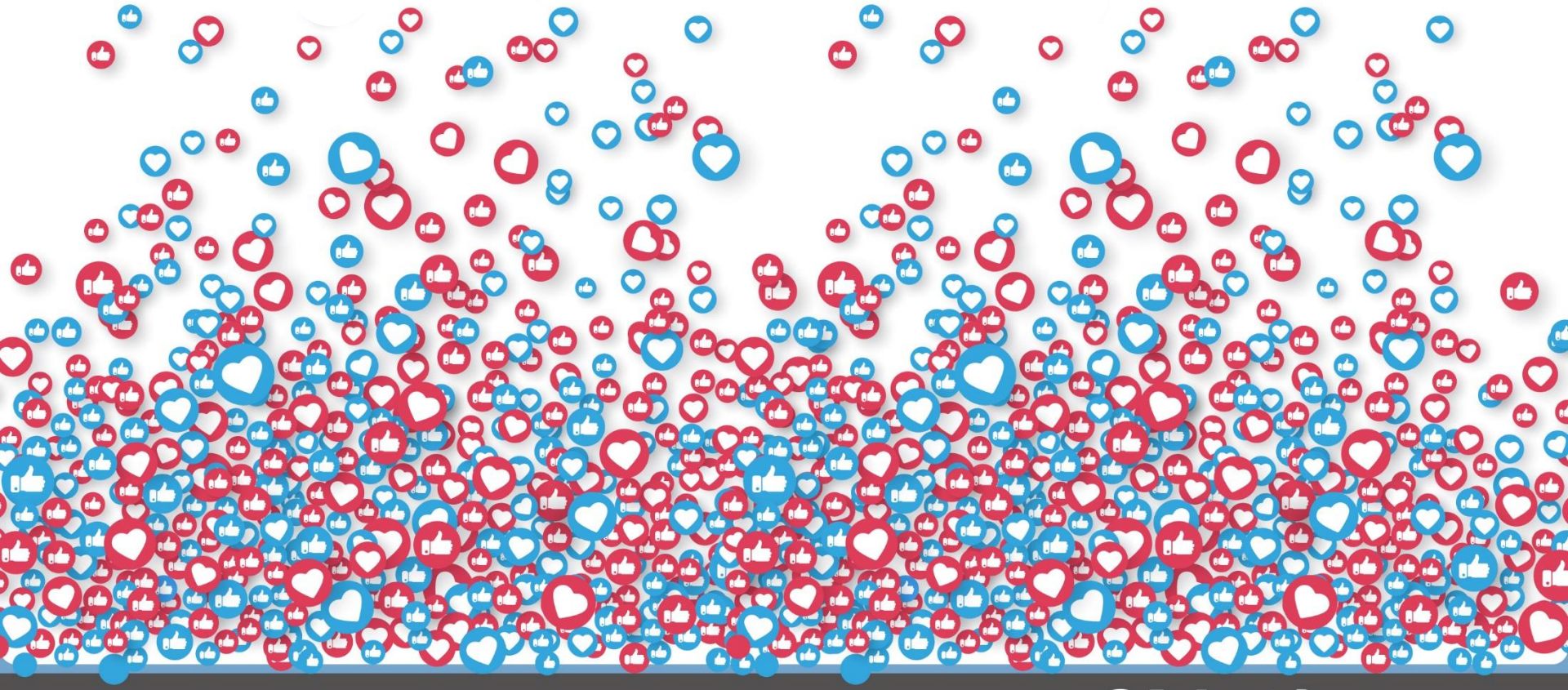
- Cohort 19
- Cohort 20
- Cohort 21

MMR Typologies 2021-2022

	Rural		Small Town		Suburban		Urban		Other	Total
	1	2	3	4	5	6	7	8		
NE	1	1	2	2	6	3	3-5	11-13	3	**32-36**
NW	1	2	1	3	1	1				**9**
C		2		1		1-3		4	2	**12**
SE	5-7	2	1	1					2	**9-13**
SW	1	1	6	4	7	3-5	4-6	1	2	**29-33**
Total	8-10	8	10	11	14	8-12	7-11	16-18	9	
Total Schools	**16-18**		**21**		**22-26**		**23-30**		**9**	**91-103**

Clarifying Questions

@OHEducation



Ohio Department of Education

Share your learning community with us!

#MyOhioClassroom

Celebrate educators!

#OhioLovesTeachers

Main OATN Website:
ohiohighered.org/transfer

TRANSFER TALK Tuesday

Next Webinar: March 16th at 1:00PM
Credit When It's Due

ohiohighered.org/transfer/Transfer_Talk_Tuesday

Subgroup 5 Co-Leads

Brad Findell
The Ohio State University

Christina Hamman
Medina High School

Andrew Tonge
Kent State University

Lee Wayand
Columbus State Community College